A Description of the Exhibit

TWO STEERS ON THE SAME TRAIL

Shown by the

UNITED STATES DEPARTMENT OF AGRICULTURE

at the

Twenty - Fifth

International Live Stock Exposition

Chicago, Illinois,

November 29 to December 6,

1924.

Data Provided Through Courtesy of University of Illinois.

L-4

UNITED STATES DEPARTMENT OF AGRICULTURE

Livestock Exhibit

TWO STEERS ON THE SAME TRAIL

It has been the aim of beef cattle breeders for over a century to produce higher quality in the meat animal. Although it is difficult to measure the extent to which our beef breeds have been improved, we can safely say that it has been considerable.

The ideal beef type desired by breeder and feeder of beef cattle is an animal that will produce the largest proportion of the highest priced cuts of beef when slaughtered. This implies a low-set animal of straight lines, broad and deep bodied, and smoothly covered with a thick, even layer of firm flesh. A fine texture of hair and hide usually indicates a high quality of meat. An animal of poor breeding usually deposits its fat around the internal organs instead of interspersing it among the more valuable cuts of lean meat. This type is characterized by such undesirable features as light hindquarters, high flank, narrow thin loin, small heart girth and long, narrow head and neck.

The purpose of this exhibit is to show the incentive for further improvement of our beef breeds. A product that more nearly fulfills the requirements of the consumers usually is enough more valuable to make its production profitable. The story begins with two calves on the range, one common and one good, and compares them at different stages until they reach the consumer.

Part I. On the Range.

To give some idea of the cost of producing range calves under present conditions, the average cost for 17 prairie ranches in Colorado in 1922 is given. This is not given as an average for the whole range country and is typical only of conditions in that area for that year. The figures given were obtained by the United States Department of Agriculture and the Colorado Agricultural Experiment Station and are an average of the cost of carrying 9,351 cows which weaned 5,230 calves on these 17 ranches in 1922. These ranches raised a 56 per cent calf crop that year.

Annual Cost Per Cow and Cost of Raising a Calf to Weaning Time in Colorado - 1922.

Operating Costs:	Cost per cow	Cost per calf[1]
Winter feed and salt	$ 2.08	$ 3.71
Hired man labor	1.56	2.80
Taxes on land and cattle	1.13	2.03
Death loss on breeding herd	1.96	3.50
Depreciation on breeding herd and equipment	4.13	7.40
Repairs and miscellaneous expense	.74	1.33
Total operating costs	11.60	20.77

Annual Cost Per Cow and Cost of Raising a Calf to Weaning Time in Colorado - 1922 (Continued)

Operating Costs:	Cost per cow	Cost per calf[1]
Interest on investment (actually paid)	$ 4.03	$ 7.22
Interest on operator's own capital	4.09	7.30
Value of labor performed by ranch operator	.77	1.38

---

[1] The cost per calf is greater than the cost per cow because only 56 cows out of 100 weaned calves.

A comparison of the returns from good and common calves is given in the next table. For this purpose the returns from one of the 17 Colorado ranches producing good calves are compared with those of another ranch on which common calves are produced. An effort was made to choose for this comparison two ranches on which the cost of producing good and common calves would be fairly comparable. However, this was impossible because of the disturbing influence of other factors such as variations in per cent of calf crop and in methods of management which may have as much or more effect on the cost of producing calves as the quality of their breeding. We might expect that calves of good quality might cost somewhat more than common calves because of the greater investment in the breeding herd, which might result in a higher risk figure and more depreciation in the case of the best quality cattle. Breeding cattle of good quality, however, have this higher value because they are capable of producing more valuable calves. The difference in sales value of the calves more than makes up for any difference in the cost of producing them.

Two live calves, one grading good and the other grading common, are shown in this section of the exhibit.

Returns from Good and Common Calves

(Comparison of Calf Sales on Two Colorado Ranches in 1922)

	Good Calf	Common Calf
Weight when sold	350 pounds	310 pounds
Sales price per hundredweight	$ 7.71	$ 5.07
Sales price per head	26.98	15.72
Greater sales value of good calf as compared with common calf	11.26	

Good calves excel common calves on the range because-

1. They weigh more at the same age.
2. They sell for more per hundredweight.
3. They mature earlier.
4. They are in demand as killers, feeders and stockers, while common calves are fit mainly for stockers.
5. They may cost more to produce but they sell for much more.

Part II. In the Feed Lot.

This section of the exhibit is illustrated by two feeder steers, one grading good and the other common. As good quality calves sell for the most money when they leave the range there must be some explanation of this fact in their performance in the feed lot and at the fat cattle market. To make this comparison between the feed-lot performance of good and common steers, figures obtained in DeKalb County, Illinois, during the winter of 1922-23 by the United States Department of Agriculture and the University of Illinois are used.

Good and Common Cattle in the Feed Lot in Illinois During 1922-23.

		Good Steers	Common Steers
Number of droves....................		15	26
Number of cattle....................		703	1785
Number of days on the farm..........		174	143
Purchase weight	(pounds)	888	824
Gain in weight	"	298	189
Sales weight	"	1186	1013
Average daily gain	"	1.71	1.32
Purchase price per hundredweight		$ 7.00	$ 5.13
Original cost per head.............		62.16	42.27
Value of feed......................		36.93	28.26
Other costs........................		5.29	4.86
Cost of animal out of feed lot......		107.52	78.25
Pork and manure credit.............		6.41	6.07
Net cost out of feed lot...........		101.11	72.18
Amount sold for out of feed lot....		107.62	72.64
Profit per head....................		6.51	.46
Sale price per hundred weight (out of lot).................		9.07	7.16
Necessary margin to break even		1.52	1.99
Farm price of corn		.54	.54
Price returned per bushel of corn fed...................		.73	.55
Cost of silage per ton.............		5.00	5.00
Amount that could have been paid for feeders and break even.........		7.73	5.18

Amount of Feed and Other Costs per 100 Pounds Gain.

		Good Steers	Common Steers
Feed:			
Grain	(pounds)	664	693
Silage	"	1261	1871
Protein concentrates	"	21	29
Molasses	"	10	2
Mixed hay		225	315
Stover and straw		102	152
Pasture days		9	8
Feed cost per 100 pounds gain		$12.32	$14.92
Other costs		2.82	4.07
Total cost of 100 pounds gain		15.14	18.99
Pork and manure credit		2.14	3.21
Net cost of 100 pounds gain		$13.00	$15.78

It will be noticed that because of the better use of feed, greater gain per day and higher sales price when finished, the feeder of the good steers could have paid as much as $7.73 per hundredweight for them, while $5.18 per hundredweight was the most that could have been paid for the common steers and still break even.

Good Steers Excel Common Steers in the Feed Lot Because:

1. They require less feed per pound of gain.
2. They require a shorter feeding period for same gain.
3. They require less margin between purchase and sale price.
4. They sell for more per hundredweight.
5. They make greater daily and total gains.
6. There is greater pride in owning them.

Part III. At the Market.

Under the captions "On the Hoof" and "On the Hook" the two grades of fat steers and their carcasses are compared at the market. Weights and prices used in these comparisons are actual average figures taken from the Chicago market, October 1 to 31, 1924. The two comparisons follow:

"On the Hoof"

	Good Steers	Common Steers
Live weight	1,160 lbs.	978 lbs.
Selling price per cwt.	$9.85	$6.33
Sale price per head	$114.26	$61.91
Dressing percentage	56%	51%
Difference	$52.35	

"On the Hook"

	Good Steer Carcasses	Common Steer Carcasses
Weight.	650 lbs.	499 lbs.
Wholesale price per cwt.	$16.78	$10.75
Sale price per carcass.	$109.07	$53.64
Difference	$55.43	

When market steers of the two grades are compared on a carlot basis, including marketing costs, the contrast is even greater than that shown above, because the freight, commission, yardage and insurance charges are the same in both cases. Using average figures at the Chicago market for October, 1924, two shipments of steers from the same point to Chicago are compared. A carload of 20 steers grading good netted $803.32 more than a carload of 24 common steers of approximately the same total weight.

An analysis of the quality of cattle slaughtered at Chicago during 1923, shows that two-thirds of them failed to grade as high as "good." Only 8.2% were prime and choice; 25.6% graded good; 42.6% graded medium; 19.6% common; and 4.0% cutter and canner. These figures show that there is still great opportunity for improving the quality of the cattle slaughtered in the United States. It should be kept in mind, however, that these percentages represent an analysis of all cattle slaughtered. Great numbers of dairy cattle that are killed annually greatly reduces the total average quality. A wider use of purebred sires and better breeding methods hold the greatest opportunities for improving the quality of our market beef cattle. However, the feeder also should keep in mind the fact that proper feeding may raise feeder steers to a higher grade when finished.

"On the Block."

The characteristics of good steer beef and common steer beef are contrasted in this portion of the exhibit, under the headings of conformation, finish and quality.

Good steer beef has the following characteristics:

Conformation: Fairly blocky and smooth; thick flesh; broad loin; full round; symmetrical shoulder; and deep rib.

Finish: Well-distributed covering of creamy-white and firm fat; moderate supply of kidney and cod fat.

Quality: Flesh firm and velvety; moderately fine grained; mellow; light red; some marbling; and juicy.

Common steer beef, has the following characteristics:

Conformation: Angular and rangy; shallow flesh; narrow loin; light round; heavy shoulder; and shallow rib.

Finish: Scanty covering of yellowish soft fat; little or no kidney and cod fat.

Quality: Flesh soft; moist; very dark red; coarse grained; stringy; and no marbling.

The exhibit shows wholesale and retail cuts of the two grades of beef, including the rib, round, loin and chuck, displayed in refrigerated showcases.

A large chart shows a side of beef with the various wholesale cuts lined off and numbered, as well as the more common retail cuts derived from each wholesale cut.

A summary of the differences between good and common carcasses states that the former are used largely to supply the better class of trade such as large hotels, dining cars and discriminating households, while the latter furnish the bulk of beef used by low-class restaurants, contract commissaries, construction camps and cut-rate shops.

"On the Table"

Choose meat wisely and cook it properly. These two requirements are so closely associated in making it possible to serve roasts of first-class quality that it is difficult to mention one without in the same breath stressing the other.

A standing rib roast is considered choice as roastsgo, but there is more to know in the ordering of a cut of meat than its name, as is shown by the roasts exhibited. Each is from the seven prime ribs, but the chief difference lies in the grade of beef animal and this affects appearance, juiciness, and texture.

Therefore to be able to supply her table to the best advantage, the housewife should know first of all the characteristics of the market grades of dressed beef and the typical retail cuts sold over the counter as roasts, steaks, pot roasts, and stew meat. But even wisely chosen, a good piece of meat may easily be ruined in cooking; so in the second place, she must know the method of cooking that will bring out the best qualities of the particular grade and cut selected.

Quality: Flesh firm and velvety; moderately fine grained; mellow; light red; some marbling; and juicy.

Common steer beef, has the following characteristics:

Conformation: Angular and rangy; shallow flesh; narrow loin; light round; heavy shoulder; and shallow rib.

Finish: Scanty covering of yellowish soft fat; little or no kidney and cod fat.

Quality: Flesh soft; moist; very dark red; coarse grained; stringy; and no marbling.

The exhibit shows wholesale and retail cuts of the two grades of beef, including the rib, round, loin and chuck, displayed in refrigerated showcases.

A large chart shows a side of beef with the various wholesale cuts lined off and numbered, as well as the more common retail cuts derived from each wholesale cut.

A summary of the differences between good and common carcasses states that the former are used largely to supply the better class of trade such as large hotels, dining cars and discriminating households, while the latter furnish the bulk of beef used by low-class restaurants, contract commissaries, construction camps and cut-rate shops.

"On the Table"

Choose meat wisely and cook it properly. These two requirements are so closely associated in making it possible to serve roasts of first-class quality that it is difficult to mention one without in the same breath stressing the other.

A standing rib roast is considered choice as roastsgo, but there is more to know in the ordering of a cut of meat than its name, as is shown by the roasts exhibited. Each is from the seven prime ribs, but the chief difference lies in the grade of beef animal and this affects appearance, juiciness, and texture.

Therefore to be able to supply her table to the best advantage, the housewife should know first of all the characteristics of the market grades of dressed beef and the typical retail cuts sold over the counter as roasts, steaks, pot roasts, and stew meat. But even wisely chosen, a good piece of meat may easily be ruined in cooking; so in the second place, she must know the method of cooking that will bring out the best qualities of the particular grade and cut selected.

The two roasts exhibited were cooked by the same method. They were roasted in the oven without moisture, which is accepted good practice for a prime rib roast and other tender cuts. The cut from the low-grade animal is so far below standard, however, that cooking by this method did not give a product comparable with the other roast. A few main principles to apply therefore not only in the selection of meat but also in its preparation for the table are outlined in the following paragraphs.

Judging the Grade of Meat

From the housekeeper's standpoint the grade of meat is determined by the following points which are applicable to all classes of dressed beef:

1. The color and texture of the lean meat, and the extent to which it is marbled with fat. Bright red color and even grain are the most desirable.

2. The thickness of the meat covering the bone, that is, the proportion of meat to bone.

3. The amount and character of the fat and its general distribution and color.

4. Amount of inside fat, such as kidney fat on the loin cut and layer fat on the inside of the ribs.

Cuts

In any one carcass the parts of the animal that have been exercised are made up of tougher muscle or coarser fiber and are drier, for example, the neck and the shank. The less-exercised parts, which are imbedded in the bone structure, have more tender muscle fiber and are more likely to have a protecti layer of fat on the outside as well as marbled fat throughout the lean. Prime rib roasts and porterhouse and sirloin steaks show these characteristics.

Effect of Grade on Other Characteristics

In general, differences between tough and tender cuts are more accentuat in low-grade beef than in the good or medium beef. The proportion of bone is higher as a rule in lower grade than in good or medium beef. The porportion of fat is lower in low-grade beef than in the medium and good grades. The best cut from a low-grade animal may be inferior in texture, flavor, and juiciness to a less choice cut from high-grade beef. In other words, a prime rib roast taken from poor beef may prove to be less desirable than rump or chuck from a higher-grade carcass.

Methods of Cooking

The choice cuts of meat are the tender cuts. These should be cooked so as to develop and retain flavor. This is done by applying heat without any moisture in the pan. A very high temperature is used at first to sear the outside so that the juices will be retained. After the outside is seared or sealed up, the heat is lowered in order that the meat may cook through without burning. This method should be used for first-class roasts and steaks such as prime ribs, porterhouse and sirloin, and even chuck and rump from the high-grade animals.

In order to make tough, dry meat tender and palatable it is necessary to apply "moist heat," or to use water in cooking. Whenever water is added, however, some of the rich flavor of the meat is sacrificed. A part of it goes into the gravy but the volatile part passes off in the air as merely an appetizing smell. In order to keep in as much of the juices as possible the meat is seared over first at a high temperature just as in the case of the tender cuts. It is then cooked slowly with moisture in the pan so as to form steam. This steam helps to make the tough fiber tender, but at the same time it softens the outer crust and allows a part of the juices to leak out carrying much of the flavor from the meat into the gravy. This method is known to the housewife as pot-roasting or oven-braising and is used to soften the fiber of a moderately tough, dry cut such as a roast from the round and brisket. If very tough meat, for example neck or shank, is being cooked it should be surrounded with water. So much of the flavor of the meat will then be in the gravy that this becomes an essential part of the meat dish.

######